

Claims

1. A plasma processing device comprising:
an inject plate;
an upper electrode; and
a hybrid ball-lock device removably securing the inject plate to the upper electrode.
2. The plasma processing device of claim 1, wherein the hybrid ball-lock device comprises an actuating hybrid ball-lock device.
3. The plasma processing device of claim 1, wherein the hybrid ball lock device comprises an actuating hybrid spring-plunger device.
4. The plasma processing device of claim 1 wherein the hybrid ball-lock device comprises a ceramic head.
5. The plasma processing device of claim 1 wherein the hybrid ball-lock device comprises a silicon head.
6. The plasma processing device of claim 1 wherein the hybrid ball-lock device comprises a quartz head.
7. The plasma processing device of claim 1 wherein the hybrid ball-lock devices comprises an anodized aluminum head.
8. The plasma processing device of claim 1 wherein the hybrid ball-lock device comprises a metallic head.
9. The plasma processing device of claim 6 wherein the head is coated with a ceramic material.
10. The plasma processing device of claim 1, wherein the hybrid ball-lock device comprises a CRES fastener housing.

11. The plasma processing device of claim 1 wherein the hybrid ball-lock device or threaded shaft is removably connected to a release button.

12. The plasma processing device of claim 1, wherein the hybrid ball-lock device comprises at least one retaining ball.

13. A method of using a hybrid ball-lock device in a plasma processing device comprising the steps of:

communicatively locating a first surface of a first plasma processing device component adjacent a second surface of a second plasma processing device component;

inserting a hybrid ball-lock device into a recess located in at least one of the first and second plasma processing device components;

wherein the hybrid ball-lock device is inserted until a retaining ball is in communication with a retaining ball receiving recess contained within at least one of the first and second plasma processing device components.

14. The method of using a hybrid ball-lock device as claimed in claim 13, wherein the ball-lock device comprises a hybrid spring plunger type ball-lock device.

15. The method of using a hybrid ball-lock device as claimed in claim 13, wherein the hybrid ball-lock device comprises an actuating type hybrid ball-lock device.

16. The method of using a hybrid ball-lock device as claimed in claim 13, wherein at least a second hybrid ball-lock device is used.

17. The method of using a hybrid ball lock device as claimed in claim 13, wherein the first plasma processing device component comprises an upper electrode including an upper electrode portion and a lower electrode portion, and the head of the hybrid ball-lock device is in contact with an inject plate.

18. The method of using a hybrid ball-lock device as claimed in claim 17, further comprising interposing a baffle plate and a lower electrode between the upper electrode portion and the inject plate, wherein the baffle plate and the lower electrode portion includes holes therein for receiving the hybrid ball-lock device.